CLAIMS

1. A device for combined sample treatment and sample carrying, comprising a plate with inlets at one side connected to respective compartments situated at respective array positions for receiving samples to be treated and analysed, **characterised** in that each compartment is in communication with an outlet enabling fluid flow through the compartment.

2. A device according to claim 1, **characterised** in that the respective outlet simultaneously serves as a restriction for retaining a medium.

3. A device according to claim 1, **characterised** in that the respective outlet comprises a restriction for retaining a medium.

4. A device according to claim 3, **characterised** in that the outlet comprises a structure with restriction apertures (106').

5. A device according to claim 3, **characterised** in that the outlet comprises a permeable membrane (504).

6. A device according to claim 1, **characterised** in that the outlet is arranged at the other side of the plate opposite the inlet, wherein the respective compartment is formed between the inlet and the outlet.

7. A device according to any one of claims 1 to 6, **characterised** in that the shape of the compartment is any one of conical, cylindrical, square, rectangular, triangular, rhombic or pyramidal, or a combination thereof.

8. A device according to any one of claims 1 to 5, **characterised** in that the outlet is arranged at the other side of the plate displaced from the inlet, wherein the respective compartment is formed between the inlet and the outlet.

9. A device according to claim 1, **characterised** in that the outlet is arranged at the same side of the plate displaced from the inlet, wherein the respective compartment is formed between the inlet and the outlet.

10. A device according to claim 8 or 9, **characterised** in that the respective compartment is formed as a channel directed in the same plane as the plate.

11. A device according to claim 10, **characterised** in that the respective compartment comprises a restriction for retaining a medium.

12. A device according to claim 11, **characterised** in that the restriction comprises a grid.

13. A device according to claim 12, **characterised** in that the grid comprises walls (206) or pillars (207).

14. A device according to claim 11, **characterised** in that the restriction comprises a heel (208).

15. A device according to any one of claims 1 to 14, **characterised** in that the respective inlet comprises a structure, such as bars (109), for hindering matter to enter the compartment.

16. A device according to any one of claims 1 to 15, **characterised** in that an analysis zone is arranged at each outlet.

17. A device according to claim 16, **characterised** in that the analysis zone is structured to achieve a well defined analysis area.

18. A device according to claim 17, **characterised** in that the analysis zone structure comprises a well (616), circular walls (609), pillars (611), a chimney-like structure (612), a trench (617) or a combination thereof.

19. A device according to claim 17, **characterised** in that the analysis zone structure comprises a patterned structure, such as a hydrophilic layer (614) or a hydrophobic layer (613), or a nanoporous surface (614) or a planar surface (613) or a combination thereof.

20. A device according to any one of claims 1 to 19, **characterised** in that a structured zone (615) is arranged at each inlet.

21. A device according to claim 20, **characterised** in that the structured zone comprises a well, circular walls (615), pillars, a chimney-like structure, a trench or a combination thereof.

22. A device according to claim 20, **characterised** in that the structured zone comprises a patterned structure, such as a hydrophilic layer (614) or a hydrophobic layer (613), or a

nanoporous surface (614) or a planar surface (613) or a combination thereof.

23. A device according to any one of claims 1 to 19, **characterised** in that one or both of the sides of the device is made hydrophobic.

24. A device according to any one of the preceding claims, **characterised** in that the device is connectable to a suction fixture (812).

25. A device according to any one of the preceding claims, **characterised** in that the device is stackable to be connectable to a further device.

26. A device according to claim 25, **characterised** in that the device comprises a mating means, such as O-ring means arranged to seal around repetitive outlets and inlets.

27. A device according to any one of the preceding claims, **characterised** in that the device is arranged to generate electrospray.

28. A device according to claim 27, **characterised** in that the device comprises a nozzle (1411, 1502) at each outlet, and an electrode (1413, 1504) at each compartment.

29. A device according to claim 28, **characterised** in that the nozzle is in the form of a pyramidal nozzle, a cylindrical nozzle or a conical nozzle.

30. A device according to any one of the preceding claims, **characterised** in that the device is manufactured of a polymeric material.

31. A device according to any one of the preceding claims, **characterised** in that the device is manufactured by a microfabrication technique.

32. A device according to claim 30 or 31, **characterised** in that the device is plated with metal, such as Au, Ag, Cu or Pt.

33. A method for analysis of samples using a combined sample treatment and sample carrier device comprising a plate with inlets at one side connected to respective compartments situated at respective array positions for receiving samples to be treated and analysed, each compartment being in communication with an outlet enabling fluid flow through the compartment comprising the steps of:
supplying an external container with a sample;

optionally, subjecting the sample to a first treatment in the external container; transferring the sample to the combined sample treatment and sample carrier device; subjecting the sample to a second treatment exploiting fluid flow through the device, wherein a medium is trapped in the device.

34. A method according to claim 33, **characterised** in that the sample comprises an analyte and a medium, wherein the first treatment comprises capture of substances in the analyte to the medium.

35. A method according to claim 33, **characterised** in that the sample comprises an analyte and the combined sample treatment and sample carrier device is supplied with a medium separately, wherein the second treatment comprises capture of substances in the analyte to the medium.

36. A method according to claim 35, **characterised** in that the external container is a basin in which the combined sample treatment and sample carrier device is submerged to transfer the sample.

37. A method according to any one of claims 33 to 36, **characterised** in that the second treatment comprises washing, wherein a washing solution is drawn through the combined sample treatment and sample carrier device.

38. A method according to any one of claims 33 to 37, **characterised** in that the second treatment comprises elution, wherein an elution solution is drawn through the combined sample treatment and sample carrier device.

39. A method according to any one of claims 33 to 38, **characterised** in that the second treatment comprises transferring the sample to an analysis zone on the combined sample treatment and sample carrier device.

40. A method according to any one of claims 33 to 39, **characterised** in that the sample is drawn through the combined sample treatment and sample carrier device to the analysis zone.

41. A method according to claim 39 or 40, **characterised** in that the sample is subjected to crystallisation in the analysis zone.

42. A method according to claim 41, **characterised** in that the sample is drawn through the combined sample treatment and sample carrier device to the analysis zone with a solution containing a matrix for LDI, such as DHB, CHCA, FA, SA and THAP.

43. A method according to any one of claims 39 to 42, **characterised** in that the analysis zone is situated on the underside, and the combined sample treatment and sample carrier device is turned upside down for subjecting said plate to an analysis instrument.

44. A method according to any one of claims 33 to 38, **characterised** in that the second treatment comprises electrospraying the sample to an analysis instrument.

45. A method according to any one of claims 33 to 44, **characterised** in that the combined sample treatment and sample carrier device is placed in a suction fixture that is operated to aspirate fluid through the device as and when required in the respective steps.

46. A method according to any one of claims 34 to 45, **characterised** in that the medium has a selective affinity for various biomolecules.

47. A method according to claim 46, **characterised** in that the medium has hydrophilic, hydrophobic, cation exchange, RP, SCX, IMAC or IEX functionality.

48. A method according to claim 46 or 47, **characterised** in that the medium comprises beads, particles, membranes or Empore disc pieces.

49. A method according to any one of claims 46 to 48, **characterised** in that the medium is supplied to the combined sample treatment and carrier plate by in-situ (in-chip) polymerisation, such as a medium of porous polymer monolith.

50. A method according to any one of claims 33 to 49, **characterised** in that the combined sample treatment and sample carrier device comprises several stacked plates.

51. A method according to claim 50, **characterised** in that different media are carried by the different plates.

52. A method according to claim 51, **characterised** in that the second treatment is performed simultaneously in the stacked plates.

53. A method according to claim 51, **characterised** in that part of the second treatment is performed simultaneously in the stacked plates, and then the stack is disassembled for separate treatment of the plates.

54. A method according to any one of claims 33 to 53, **characterised** in that the combined sample treatment and sample carrier device after the second treatment is subjected to analysis.

55. A method according to claim 54, **characterised** in that the analysis is optical, such as fluorescence detection, laser detection, scintillation detection or microscopy.

56. A method according to claim 54, **characterised** in that the analysis comprises mass spectroscopy (MS), such as LDI, ESI, SELDI, DIOS, MALDI TOF-TOF, MALDI Q-TOF.

57. A method according to any one of claims 33 to 56, **characterised** in that the second treatment comprises treatment with reagents for enzymatic or chemical reactions.

58. A method according to claim 57, **characterised** in that the second treatment comprises enzymatic digestion.

59. A method according to claim 57, **characterised** in that the second treatment comprises dephosphorylation.

60. A method according to any one of claims claim 57 to 59, **characterised** in that the sample and/or reagents are supplied by means of dispensing or contact printing.

61. A method according to any one of claims 33 to 60, **characterised** in that the sample contains an analyte comprising biomolecules such as peptides, proteins, oligonucleotides, antibodies, DNA, carbohydrates or phosphopeptides.

62. A method according to any one of claims 33 to 61, **characterised** in that the external container is a microtitreplate.